

REMARKS

I. Introduction

Claims 8-15 are currently pending in this application. Claims 8, 13, 14 and 15 have been amended to further define the subject matter of the claims, support for which is found, for example on pages 10-11, paragraph [0018] and on page 19, paragraph [0033] of the originally filed specification. No new matter has been added.

For the following reasons the application should be allowed and passed to issue.

II. Claim Rejections Under 35 U.S.C. § 103(a)

A. Mohanty or Ohme, in combination with either Fumitomo or Gilman and Lee

Claims 8-10 and 13-15 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over either Mohanty or Ohme, in combination with either Fumitomo or Gilman and further in view of newly cited prior art reference Lee et al., U.S. Patent No. 6,337,363.

Applicants respectfully disagree. However, in an effort to expedite prosecution, independent claims 8, 13, 14 and 15 have been amended and each now recite, in pertinent part:

wherein said at least one resin component is selected from the group consisting of:

a **thermoplastic** biodegradable resin,

a **thermoplastic** polymer obtained by polymerizing a monomer, which is obtained from plant material, and

a **thermoplastic** copolymer consisting of a plant derived monomer and a non-plant derived monomer . . . wherein said flame retardancy-imparting component is supported on an inorganic porous material before it is dispersed in said resin composition. [Emphasis added].

A *prima facie* obviousness rejection under 35 U.S.C. § 103(a), can be established if basic criteria are met. First, is some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to

combine reference teachings. Second, is there a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must not be based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Moreover, it is well established that, if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

The Examiner at page 5 of the office action dated December 12, 2008 concedes that none of the cited prior art references teach that the flame retardant is supported *before* mixing with the polymer, and therefore rely on Lee for this alleged disclosure.

However, Applicants respectfully submit that a person having ordinary skill in the art would not have found it obvious to combine the teachings of Mohanty or Ohme with the teachings of either Fumitomo or Gilman with the teachings of Lee, in order to arrive at the subject matter as recited in amended claims 1, 13, 14 and 15. This is at least because rather than teach the use of a **thermoplastic** resin as recited in the instant claims, Lee teaches the use of an epoxy resin composition that is a **thermoset**. Thus, Lee effectively teaches away from what is presently claimed.

As defined in Webster's NewWorld Dictionary, Third College Edition, 1994, a "thermoplastic" becomes or remains soft and moldable when subjected to heat. In contrast, a "thermoset" becomes permanently hard and rigid when once subjected to heat. See Webster's NewWorld Dictionary, Third College Edition page 1389.

Further, based on Lee, it is respectfully submitted that there would not be a reasonable expectation of success for obtaining the claimed subject matter. Moreover, modifying Lee to use a thermoplastic rather than a thermoset would render Lee modified unsatisfactorily for its intended purpose of using a silica-novolac solution.

Lee discloses an epoxy resin composition containing a) an epoxy resin, b) a phenolic novolac hardener and c) a silica-novolac hybrid resin solution as a flame retardant (see Lee claim 1). A person having ordinary skill in the art would readily recognize that epoxy resin is a *thermosetting* resin and is provided in a form of a liquid or viscous substance. The epoxy resin is then cured (or hardened) by the means of heat and the hardener. Therefore, the silica-novolac hybrid resin solution of Lee is added to and mixed with the other components, and exists in the form of liquid (that is, "solution") in the resin composition of Lee.

In contrast, the resin composition as recited in the present claims is a **thermoplastic** resin composition and is provided in a form of **solid** or relatively hard substance. In the present thermoplastic resin composition, the flame retardancy-imparting component supported on the inorganic porous material is dispersed in the form of nano-scale particulate. As such, the flame retardancy-imparting component supported on the inorganic porous material is added in the form of dry powder. In preparing the supported flame retardancy-imparting component on the inorganic porous material, the inorganic porous material is immersed in a liquid in which the flame retardancy-imparting component to be supported on the inorganic porous material is dissolved or dispersed, but the liquid is finally removed by evaporation (see, paragraph [0034] of the originally filed specification). This **dry** supported flame retardancy-imparting component on the inorganic porous material is crushed into the nano-scale particulate and evenly dispersed in

the resin composition by a shear force applied upon kneading the resin component and the dry support flame retardancy-imparting component.

In other words, the improvement in flame retardancy is conferred by the fact that the supported flame retardancy-imparting component is **dry and solid** and because the resin is a **thermoplastic resin**.

Lee describes that the silica-novolac hybrid resin solution is added as the dry substance or that the silica-novolac hybrid solution is dispersed in the form of a nano-scale particulate. (See, Lee col. 4 lines 8-16). Further, considering the boiling points of propanol (97.15°C) and isopropanol (82.4 °C), it appears that the isopropanol and propanol were left in the silica-novolac hybrid resin solution prepared in the “Preparation Example” discussed in col. 3, lines 60, to col. 4, line 45 of Lee, in which the mixture is heat to 60°C, making the *solution liquid*.

As such, Lee *teaches the away* from using thermoplastic resin as recited in claims 8, 13, 14 and 15 in favor of using a thermoset resin. Lee also does not teach a dry and solid flame-retardancy component, but rather teaches a silica-novolac hybrid resin solution that is added to and mixed with the other components, and exists in the form of liquid. Therefore, it is clear that a person having ordinary skill in the art would not have found it obvious to combine Lee with the other cited prior art references to obtain the subject matter recited in the present claims.

Furthermore, as discussed above, Ohme does not teach or suggest that the flame retardant is supported *before* mixing with the polymer. Ohme does disclose the use of thermoplastic resins, (see page 6, paragraph [0087]). However, a person having ordinary skill in the art would not combine the teachings of Ohme with that of Lee as Lee teaches away from using a thermoplastic resin.

As such, Lee can not be combined with the other cited prior art references in a manner that does not destroy the teachings of Lee. Furthermore, because Lee can not be combined with the other cited prior art references, the other cited prior art references remain deficient in teaching or suggesting all of the elements of claims 8, 13, 14 and 15.

Accordingly, it is respectfully submitted that claims 8, 13, 14 and 15 are allowable over the cited prior art references.

Furthermore, claims 9-12 depend from and further define the subject matter of claim 8 and therefore are also allowable.

B. Mohanty or Ohme, in combination with either Fumitomo or Gilman and further in view of Dorfman and Lee

Claims 11 and 12 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over either Mohanty or Ohme, in combination with either Fumitomo or Gilman and further in view of Dorfman and Lee. Applicants respectfully disagree with this rejection. However, in an effort to expedite prosecution, claims 8, 13, 14 and 15 have been amended to recite that the resin used is a thermoplastic resin. As discussed above, in reference to the rejection of claims 8-10 and 13-15 under 35 U.S.C. § 103(a), a person having ordinary skill in the art would not have found it obvious to combine either Mohanty or Ohme, with either Fumitomo or Gilman and Lee to obtain the subject matter as recited in claims 8, 13, 14 and 15.

Moreover, the addition of Dorfman to the combination of references can not cure this teaching away of Lee because Dorfman does not teach that the flame retardancy-imparting component is supported on an inorganic porous material before it is dispersed in said resin composition. However, Dorfman teaches the use of a “thermoplastic additive,” (see, col. 12, line 44). As such, a person having ordinary skill in the art would not combine the teachings of Ohme

or Dorfman with that of Lee as Lee teaches away from using a thermoplastic, as recited in claims 8, 13, 14 and 15 and disclosed in Ohme and Dorfman.

As such, Lee can not be combined with the other cited prior art references in a manner that does not destroy the teachings of Lee. Furthermore, because Lee can not be combined with the other cited prior art references, the other cited prior art references remain deficient in teaching or suggesting all of the elements of claims 8, 13, 14 and 15.

Accordingly, it is respectfully submitted that claims 8, 13, 14 and 15 are allowable over the cited prior art references.

Furthermore, claims 11 and 12 depend from and further define the subject matter of claim 8 and therefore should also be allowed.

III. Conclusion

In view of the above amendments and remarks, Applicants respectfully submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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